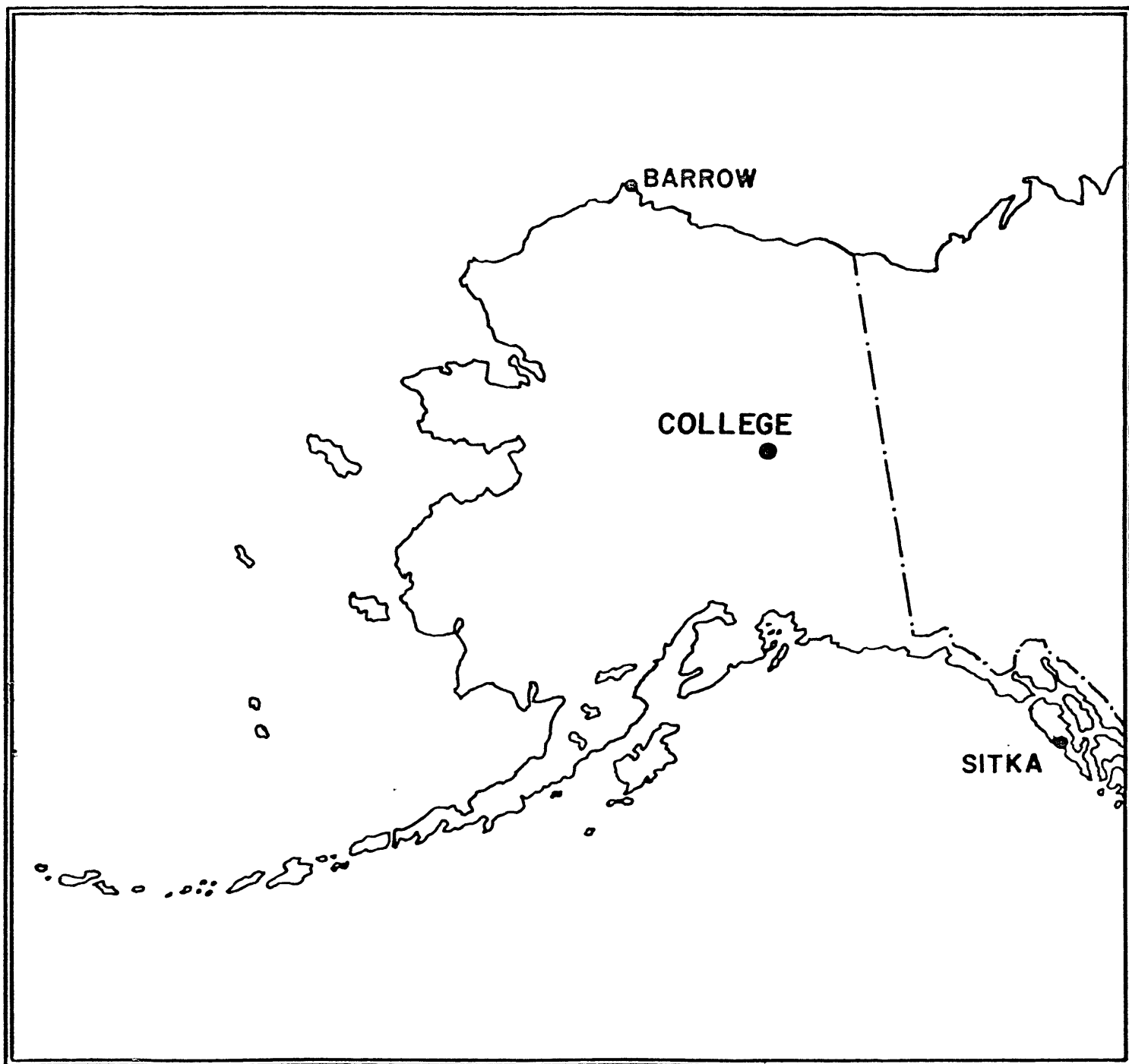


UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

PRELIMINARY GEOMAGNETIC DATA
COLLEGE OBSERVATORY
FAIRBANKS, ALASKA

FEBRUARY 1984

OPEN FILE REPORT 84-0300B



THIS REPORT WAS PREPARED UNDER THE DIRECTION OF JOHN B. TOWNSHEND, CHIEF OF THE COLLEGE OBSERVATORY, WITH THE ASSISTANCE OF THE OBSERVATORY STAFF MEMBERS: J.E. PAPP, E.A. SAUTER, L.Y. TORRENCE, P.A. FRANKLIN AND IN COOPERATION WITH THE GEOPHYSICAL INSTITUTE OF THE UNIVERSITY OF ALASKA, THE COLLEGE OBSERVATORY IS A PART OF THE BRANCH OF GLOBAL SEISMOLOGY AND GEOMAGNETISM OF THE U.S. GEOLOGICAL SURVEY.

Explanation of Data and Reports

Magnetic Activity Report

Outstanding Magnetic Effects

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Preliminary Calibration Data and Monthly Mean Absolute Values

Magnetogram Hourly Scalings

Sample Format for Normal and Storm Magnetograms

Normal Magnetograms

Storm Magnetograms (When Normal is too disturbed to read)

COLLEGE OBSERVATORY PRELIMINARY GEOMAGNETIC DATA

EXPLANATION OF DATA AND REPORTS

INTRODUCTION

The preliminary geomagnetic data included here is made available to scientific personnel and organizations as part of a cooperative effort and on a data exchange basis because of the early need by some users. To avoid delay, all of the data is copied from original forms processed at the observatory; therefore it should be regarded as preliminary. Inquiries about this report or about the College Observatory should be addressed to:

Chief, College Observatory
U.S. Geological Survey
800 Yukon Drive
Fairbanks, Alaska 99701

Requests for copies of the magnetograms except for the current month should be addressed to:

World Data Center A
NOAA D63, 325 Broadway
Boulder, Colorado 80303

OBSERVATORY LOCATION

The College Observatory, operated by the U.S. Geological Survey, is located at the University of Alaska, Fairbanks, Alaska. It is near the Auroral Zone and the northern limit of the world's greatest earthquake belt, the circum-Pacific Seismic belt. Although the observatory's basic operation is in geomagnetism and seismology, it cooperates with other scientists and organizations in areas where the facility and personnel can be of service.

The observatory is one of three operated by the USGS in Alaska. The others are located at Barrow and Sitka.

The position of the observatory site is:

Geographic latitude..... $64^{\circ}51.6'N$
Geographic longitude..... $147^{\circ}50.2'W$
Geomagnetic latitude..... $+64.6^{\circ}$
Geomagnetic longitude..... $+256.5^{\circ}$
Elevation.....200 meters

GEOMAGNETIC DATA

Normal, Storm and Rapid Run magnetograms and appropriate calibration data are processed daily at the observatory and are available for analysis or copying. Also available, are mean hourly scalings, K-Indices, selected magnetic phenomena reports and on a real-time basis are recordings from a 3-component fluxgate magnetometer and F-component proton magnetometer.

Magnetic Activity

The K-Index: The K-Index is a logarithmic measurement of the range of the most disturbed component (D or H) of the geomagnetic field for eight intervals beginning 0000-0300, 0300-0600...2100-2400 UT. It is a measure of the difference between the highest and lowest deviation from a smooth curve to be expected for a component on a magnetically quiet day, within a three hour interval.

The Equivalent Daily Amplitude, AK: The K-Index is converted into an equivalent range, ak, which is near the center of the limiting gamma ranges for a given K. The average of the eight values is called equivalent daily amplitude AK. The unit 10γ has been chosen so as not to give the illusion of an accuracy not justified.

The schedule for converting gamma range to K, and K to ak is as follows:

Gamma Range	K - Index	ak
0 < 25	0	0
25 < 50	1	3
50 < 100	2	7
100 < 200	3	15
200 < 350	4	27
350 < 600	5	48
600 < 1000	6	80
1000 < 1650	7	140
1650 < 2500	8	240
2500+	9	400 (10γ)

The Magnetic Daily Character Figure, C: To each Universal day a character is assigned on the basis C=0, if it is quiet; C=1, if it is moderately disturbed; C=2, if it is greatly disturbed. The method used to assign characters at the College Observatory is based on AK as follows:

AK Range	C
0-11	0
11-50	1
50+	2

Routine assignment of C was discontinued at College on January 1, 1976.

Selected Phenomena & Outstanding Magnetic Effects

Prior to January 1, 1976, the Normal and Rapid Run records were reviewed at the observatory for selected magnetic phenomena and the events identified were forwarded to the IUGG Commission on Magnetic Variations and Disturbances. This was discontinued on January 1, 1976, but a report on Outstanding Magnetic Effects is prepared monthly for this report.

Principal Magnetic Storms

Gradual and sudden commencement magnetic disturbances with at least one K-Index of 5 or greater, which are believed to be part of a world-wide disturbance, are classified as principal magnetic storms. The time of the storm beginning and ending; direction and amplitude of sudden commencements; period of maximum activity; and storm range are reported. Monthly reports of these data are forwarded to the World Data Center A in Boulder, Colorado.

Magnetogram Hourly Scalings

Magnetogram hourly scalings are averages for successive periods of one hour for the D, H and Z elements. The Value in the column headed "01" is the average for the hour beginning 0000 and ending 0100. Note that the values on the scaling sheets are in tenths of mm with the decimal point omitted. The user of these scalings should keep in mind that the tabular values are hourly means and if he is interested in the detailed morphology of the magnetic field, he should refer directly to the magnetograms.

Magnetograms

The normal magnetograms in this report are reproduced at about one-third the size of the originals. Preliminary base-line values and scale values adopted for use with the original magnetograms are included. For days when the magnetic field is too disturbed for the Normal magnetogram to be readable, Storm magnetograms are reproduced.

Absolutes, Base-lines and Scale Values

To determine the absolute value of the magnetic field from the hourly means or from point scalings the following equations should be used:

$$D = B_D + d \cdot S_D; H = B_H + h \cdot S_H; Z = B_Z + z \cdot S_Z$$

where D, H and Z are absolute values;

B_D , B_H and B_Z are base-line values;

S_D , S_H and S_Z are scale values;

and d, h and z are scalings in millimeters.

COLLEGE, ALASKA

MAGNETIC ACTIVITY

(Greenwich civil time, counted from midnight to midnight)

MONTH AND YEAR

FEBRUARY 1984

DATE	K-INDICES								AK	TIME SCALE ON MAGNETOGRAMS			
	00-03	03-06	06-09	09-12	12-15	15-18	18-21	21-24		SUM	20 mm/hr		
											SUDDEN COMMENCEMENTS		
1	3	3	5	6	2	2	3	1	25	24	d	h	m
2	1	1	2	2	4	4	4	4	22	16			
3	5	2	2	1	1	3	3	4	21	16			
4	3	4	6	5	6	6	5	5	40	53			
5	3	3	4	6	5	4	1	0	26	27			
6	1	1	0	3	4	2	3	3	17	11			
7	2	2	3	4	4	2	1	1	19	12			
8	2	1	4	4	3	1	1	1	17	11			
9	2	2	2	3	4	3	1	1	18	11			
10	1	1	2	6	5	6	5	3	29	36			
11	5	3	3	4	4	3	2	1	25	20			
12	1	1	2	1	2	3	1	3	14	07			
13	4	3	4	6	6	5	5	2	35	42			
14	5	5	5	6	7	6	3	4	41	61			
15	4	4	4	6	2	1	0	1	22	22			
16	2	2	1	2	4	1	2	1	15	08			
17	1	2	2	4	3	2	1	1	16	09			
18	3	4	4	6	6	5	3	1	32	37			
19	1	0	1	2	4	5	3	1	17	13			
20	1	1	2	1	0	3	2	3	13	07			
21	3	3	3	4	5	5	2	2	27	23			
22	2	2	2	2	4	3	2	1	18	10			
23	1	2	4	4	6	3	2	1	23	21			
24	2	1	1	6	1	3	3	1	18	16			
25	2	0	2	6	2	0	1	2	15	14			
26	0	0	2	5	5	5	4	3	24	24			
27	3	3	6	6	4	3	3	4	32	34			
28	3	2	5	3	5	4	1	1	24	21			
29	0	1	4	5	4	4	2	0	20	17			
30													
31													

K SCALE USED:

LOWER LIMIT FOR K = 9.....

CURRENT SCALE VALUE.....

LOWER LIMIT FOR K = 9

D

675.7

3.72

2510

H

322.2

7.76

2500

Z

(mm)

(γ/mm)

(to nearest 10γ)

SCALINGS AND COMPUTATIONS HAVE BEEN CHECKED.

APPROVED

JOHN B. TOWNSHEND, CHIEF, COLLEGE OBSERVATORY

OBSERVER IN CHARGE

OUTSTANDING MAGNETIC EFFECTS			OBSERVATORY COLLEGE, ALASKA	
			MONTH FEBRUARY	YEAR 1984
DATE	TIME U.T.	NATURE OF PHENOMENON ¹	REMARKS	
16	08xx	pi 2		
19	08xx	pi 2	with bay	
20	16xx	pc5		
IDENTIFIED BY: JEP			VERIFIED BY: JBT	

1. NATURE OF PHENOMENON: ssc, ssc*, si, si*, b, bp, bs, bps, pcl, pc2 - - - pc5, pg, pi 1, pi 2, sfe.

PRINCIPAL MAGNETIC STORMS
COLLEGE OBSERVATORY, COLLEGE, ALASKA
February 1984WDC-A FOR SOLAR-TERRRESTRIAL PHYSICS
ENVIRONMENTAL DATA SERVICE, NOAA
BOULDER, COLORADO 80502 U.S.A.Data from Individual Observatories:

Obs. 2 letter IAGA code	Geomag. lat.	Commencement		SC - amplitudes			Max. 3 hr - Index K			Ranges			UT End	
		day	hr min (UT)	type	D(')	H(Y)	Z(Y)	day	(3 hr - period)	K	D(')	H(Y)	Z(Y)	day hr
CO	64°6 N	03	15xx	..	..	..	..	04 05	3, 5, 6 4	6 6	191	1440	980	05 16
		12	14xx	..	..	..	..	14	5	7	217	1670	970	15 13

NORMAL MAGNETOGRAPH

COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0000 U.T., 2-1-84	2400 U.T., 2-29-84	1.0/mm	3.78/mm	27° 16.9 E
H	0000 U.T., 2-1-84	2400 U.T., 2-29-84	7.88/mm		126578
Z	0000 U.T., 2-1-84	2400 U.T., 2-29-84	7.68/mm		551838

STORM MAGNETOGRAPH

COMPONENT	PERIOD		CALIBRATION		
	FROM	TO	SCALE VALUE		BASELINE
D	0000 U.T., 2-1-84	2400 U.T., 2-29-84	7.9/mm	29.68/mm	24° 24.6 E
H	0000 U.T., 2-1-84	2400 U.T., 2-29-84	43.98/mm		107708
Z	0000 U.T., 2-1-84	2400 U.T., 2-29-84	48.08/mm		540928

RAPID RUN MAGNETOGRAPH

COMPONENT	PERIOD		CALIBRATION	
	FROM	TO	SCALE VALUE	
D				
H				
Z				

MONTHLY MEAN ABSOLUTE VALUES*

D	H	Z
27° 48.4 E	129298	553668

* COMPUTED FROM TEN QUIETEST DAYS DURING MONTH.

DAYS USED: FEB 6, 7, 8, 9, 12, 16, 17, 19, 20, 22

MAGNETOGRAM HOURLY SCALINGS

(UNIVERSAL TIME)

Values are in tenths of mm. and are averages for successive periods of one hour beginning at midnight. Hour 01 of local day (150 M.T.) is hour 11 of the 8888 universal day.
Shrinkage corrections have been applied. Negative values are in red, with minus sign shown.

OBSV.		YEAR		MONTH		ELE- MENT																				
CO		84		FEB		Z																				
U.S. DEPARTMENT OF INTERIOR Geological Survey, Geological Division Bureau of Mineral Resources, Denver, CO 80215																										
150 M.T. is hour 11 of the 8888 universal day.																										
C	Q	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	SUM
01	291	299	272	293	276	272	283	291	263	99	77	129	01	192	210	221	233	244	237	251	237	244	250	248	247	5559
02	256	256	256	249	247	246	249	256	264	264	256	236	02	127	60	95	58	108	90	118	158	124	185	362	305	4925
03	313	284	304	291	270	270	265	272	268	252	251	250	03	249	244	234	226	204	221	220	203	189	206	250	290	6026
04	239	283	324	235	74	-114	29	99	238	261	314	04	688	730	897	882	246	33	44	5	124	212	209	276	6104	
05	294	277	272	278	320	334	287	290	241	354	430	05	399	250	220	188	241	278	280	274	265	263	260	267	6904	
06	270	276	277	270	276	283	293	290	282	268	168	06	212	245	181	180	231	238	216	112	72	165	214	252	5483	
07	264	270	279	289	281	284	286	287	266	138	255	07	295	201	252	259	249	255	248	255	250	242	246	241	6173	
08	277	289	277	266	260	257	266	270	276	342	298	08	223	260	196	216	259	262	256	243	222	208	209	220	6097	
09	245	266	282	275	268	289	288	349	302	278	229	09	212	218	233	208	231	258	240	236	242	227	237	243	6077	
10	256	257	267	263	254	264	259	283	303	282	73	10	100	97	-12	-147	-72	29	22	44	88	143	235	258	3508	
11	288	255	234	247	279	298	287	198	202	170	225	11	248	356	264	190	237	237	234	203	208	206	225	245	5749	
12	248	266	263	262	267	268	279	310	288	293	277	12	271	259	190	183	187	213	243	242	227	205	146	159	5812	
13	244	290	257	250	249	246	226	274	292	184	-23	13	143	372	411	346	220	-16	99	126	190	215	247	277	5256	
14	306	306	256	77	181	185	118	332	286	219	370	14	385	309	293	563	195	212	249	245	213	205	224	262	6589	
15	304	351	287	296	317	249	161	303	247	206	245	15	171	240	253	250	250	256	254	248	247	244	245	254	5850	
16	269	273	279	287	276	279	272	267	269	246	212	16	168	120	200	200	213	236	236	211	232	243	244	246	5681	
17	256	256	260	255	273	330	316	278	263	247	95	17	167	220	232	227	228	246	246	237	244	246	248	253	5711	
18	247	287	299	336	312	335	308	310	283	194	19	18	215	298	142	-16	61	176	223	207	220	237	246	249	5352	
19	255	255	254	253	256	256	257	263	280	277	235	19	229	156	99	126	163	200	191	224	236	243	250	254	5457	
20	253	257	256	253	250	247	253	298	285	253	246	20	245	240	235	227	214	227	230	227	218	230	221	255	5855	
21	278	273	276	253	310	282	356	368	327	209	187	21	165	209	259	104	186	232	247	253	236	217	201	232	5834	
22	263	258	251	260	273	293	313	295	299	280	265	22	256	183	199	233	223	288	216	233	208	196	205	223	5973	
23	243	253	250	256	257	274	286	254	230	131	247	23	363	377	102	164	207	242	233	213	211	224	234	247	5751	
24	256	266	257	263	253	257	253	249	267	254	238	24	143	223	238	234	216	186	206	205	219	227	236	250	5507	
25	256	271	249	250	245	246	247	253	266	224	33	25	171	223	219	240	245	244	244	243	238	253	244	240	5501	
26	247	253	254	253	250	254	280	295	288	248	227	26	128	163	230	230	234	192	256	140	160	207	253	254	5488	
27	254	246	270	283	270	264	182	154	180	321	254	27	187	275	190	203	230	233	232	208	211	246	223	226	5567	
28	239	254	258	263	267	273	276	264	104	222	227	28	240	348	170	196	179	180	216	230	240	240	243	247	5534	
29	249	248	247	244	246	247	246	257	155	247	240	29	208	284	284	221	212	129	172	201	216	233	243	250	5584	
30												30														
31												31														
SCALED BY	LYT																								MONTHLY SUM	167907
CHECKED BY	JEP, EAS																								MONTHLY MEAN	241
REVIEWED BY	JEP																								DATES WITH GAPS:	
PUNCHED BY																										

() Interpolated
 [] Significant portion of hour interpolated.
 [] No record; no value is reliable because of faulty record.
 * Derived from STORM Mapsh., converted to Normal Meph.

Scale Value

Base-line Value

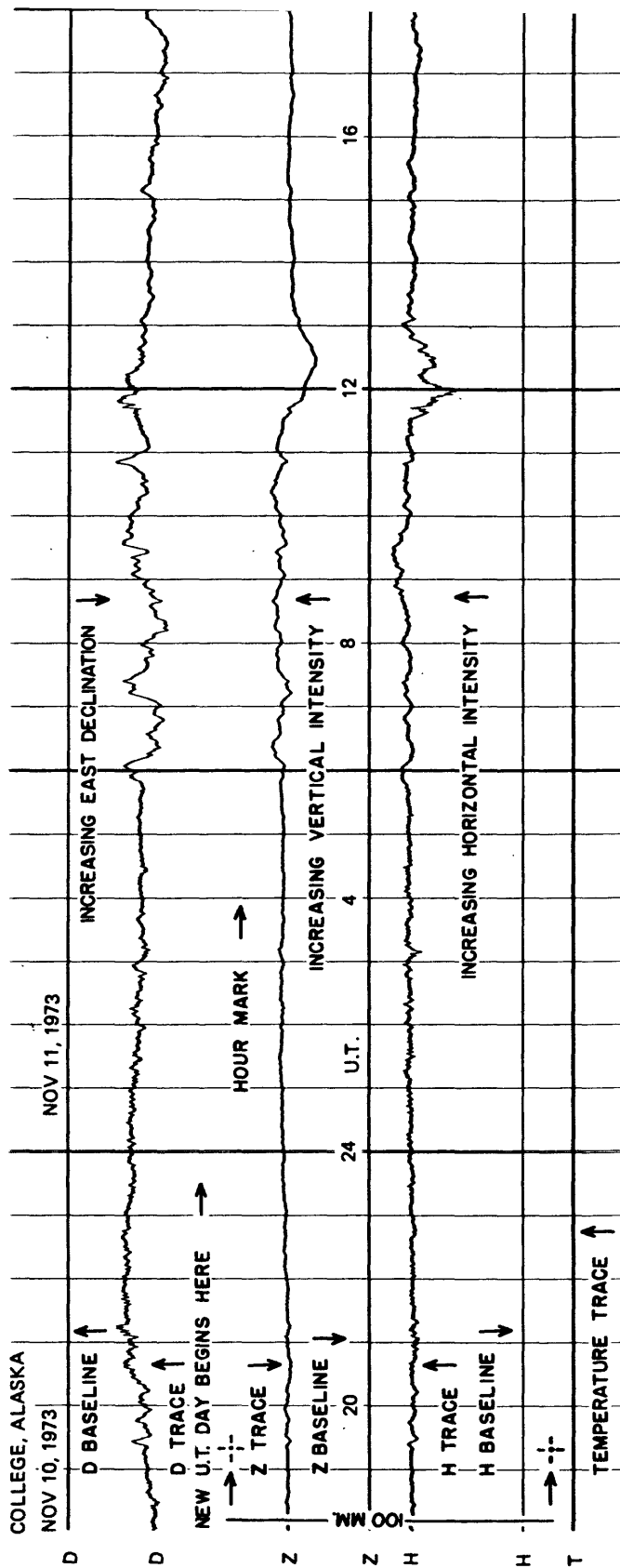
Preliminary base-line and scale values:
Interval Beginning

MAGNETOGRAM HOURLY SCALINGS

Values are in terms of gauss and are averages for successive periods of one hour beginning at midnight. Hour 01 of local day (150 M.T.) is hour 11 of the same universal day.
 Shading corrections have been applied. Negative values are in red, with minus sign above.

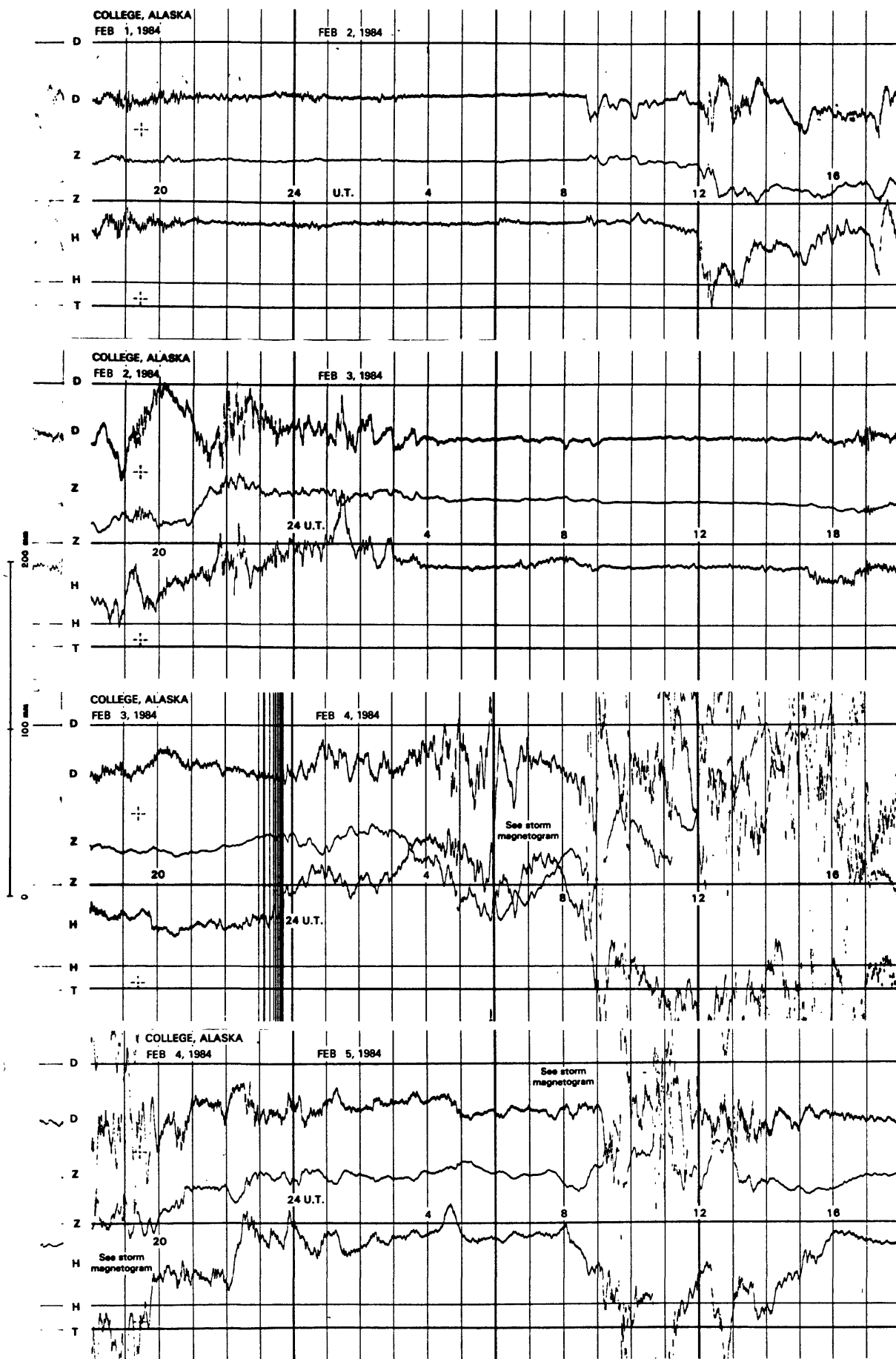
Q ₁ T ₁ S ₁		Q ₂ T ₂ S ₂		Q ₃ T ₃ S ₃		Q ₄ T ₄ S ₄		Q ₅ T ₅ S ₅		Q ₆ T ₆ S ₆		Q ₇ T ₇ S ₇		Q ₈ T ₈ S ₈		Q ₉ T ₉ S ₉		Q ₁₀ T ₁₀ S ₁₀		Q ₁₁ T ₁₁ S ₁₁		Q ₁₂ T ₁₂ S ₁₂		Q ₁₃ T ₁₃ S ₁₃		Q ₁₄ T ₁₄ S ₁₄		Q ₁₅ T ₁₅ S ₁₅		Q ₁₆ T ₁₆ S ₁₆		Q ₁₇ T ₁₇ S ₁₇		Q ₁₈ T ₁₈ S ₁₈		Q ₁₉ T ₁₉ S ₁₉		Q ₂₀ T ₂₀ S ₂₀		Q ₂₁ T ₂₁ S ₂₁		Q ₂₂ T ₂₂ S ₂₂		Q ₂₃ T ₂₃ S ₂₃		Q ₂₄ T ₂₄ S ₂₄		Q ₂₅ T ₂₅ S ₂₅		Q ₂₆ T ₂₆ S ₂₆		Q ₂₇ T ₂₇ S ₂₇		Q ₂₈ T ₂₈ S ₂₈		Q ₂₉ T ₂₉ S ₂₉		Q ₃₀ T ₃₀ S ₃₀		Q ₃₁ T ₃₁ S ₃₁		Q ₃₂ T ₃₂ S ₃₂		Q ₃₃ T ₃₃ S ₃₃		Q ₃₄ T ₃₄ S ₃₄		Q ₃₅ T ₃₅ S ₃₅		Q ₃₆ T ₃₆ S ₃₆		Q ₃₇ T ₃₇ S ₃₇		Q ₃₈ T ₃₈ S ₃₈		Q ₃₉ T ₃₉ S ₃₉		Q ₄₀ T ₄₀ S ₄₀		Q ₄₁ T ₄₁ S ₄₁		Q ₄₂ T ₄₂ S ₄₂		Q ₄₃ T ₄₃ S ₄₃		Q ₄₄ T ₄₄ S ₄₄		Q ₄₅ T ₄₅ S ₄₅		Q ₄₆ T ₄₆ S ₄₆		Q ₄₇ T ₄₇ S ₄₇		Q ₄₈ T ₄₈ S ₄₈		Q ₄₉ T ₄₉ S ₄₉		Q ₅₀ T ₅₀ S ₅₀		Q ₅₁ T ₅₁ S ₅₁		Q ₅₂ T ₅₂ S ₅₂		Q ₅₃ T ₅₃ S ₅₃		Q ₅₄ T ₅₄ S ₅₄		Q ₅₅ T ₅₅ S ₅₅		Q ₅₆ T ₅₆ S ₅₆		Q ₅₇ T ₅₇ S ₅₇		Q ₅₈ T ₅₈ S ₅₈		Q ₅₉ T ₅₉ S ₅₉		Q ₆₀ T ₆₀ S ₆₀		Q ₆₁ T ₆₁ S ₆₁		Q ₆₂ T ₆₂ S ₆₂		Q ₆₃ T ₆₃ S ₆₃		Q ₆₄ T ₆₄ S ₆₄		Q ₆₅ T ₆₅ S ₆₅		Q ₆₆ T ₆₆ S ₆₆		Q ₆₇ T ₆₇ S ₆₇		Q ₆₈ T ₆₈ S ₆₈		Q ₆₉ T ₆₉ S ₆₉		Q ₇₀ T ₇₀ S ₇₀		Q ₇₁ T ₇₁ S ₇₁		Q ₇₂ T ₇₂ S ₇₂		Q ₇₃ T ₇₃ S ₇₃		Q ₇₄ T ₇₄ S ₇₄		Q ₇₅ T ₇₅ S ₇₅		Q ₇₆ T ₇₆ S ₇₆		Q ₇₇ T ₇₇ S ₇₇		Q ₇₈ T ₇₈ S ₇₈		Q ₇₉ T ₇₉ S ₇₉		Q ₈₀ T ₈₀ S ₈₀		Q ₈₁ T ₈₁ S ₈₁		Q ₈₂ T ₈₂ S ₈₂		Q ₈₃ T ₈₃ S ₈₃		Q ₈₄ T ₈₄ S ₈₄		Q ₈₅ T ₈₅ S ₈₅		Q ₈₆ T ₈₆ S ₈₆		Q ₈₇ T ₈₇ S ₈₇		Q ₈₈ T ₈₈ S ₈₈		Q ₈₉ T ₈₉ S ₈₉		Q ₉₀ T ₉₀ S ₉₀		Q ₉₁ T ₉₁ S ₉₁		Q ₉₂ T ₉₂ S ₉₂		Q ₉₃ T ₉₃ S ₉₃		Q ₉₄ T ₉₄ S ₉₄		Q ₉₅ T ₉₅ S ₉₅		Q ₉₆ T ₉₆ S ₉₆		Q ₉₇ T ₉₇ S ₉₇		Q ₉₈ T ₉₈ S ₉₈		Q ₉₉ T ₉₉ S ₉₉		Q ₁₀₀ T ₁₀₀ S ₁₀₀		Q ₁₀₁ T ₁₀₁ S ₁₀₁		Q ₁₀₂ T ₁₀₂ S ₁₀₂		Q ₁₀₃ T ₁₀₃ S ₁₀₃		Q ₁₀₄ T ₁₀₄ S ₁₀₄		Q ₁₀₅ T ₁₀₅ S ₁₀₅		Q ₁₀₆ T ₁₀₆ S ₁₀₆		Q ₁₀₇ T ₁₀₇ S ₁₀₇		Q ₁₀₈ T ₁₀₈ S ₁₀₈		Q ₁₀₉ T ₁₀₉ S ₁₀₉		Q ₁₁₀ T ₁₁₀ S ₁₁₀		Q ₁₁₁ T ₁₁₁ S ₁₁₁		Q ₁₁₂ T ₁₁₂ S ₁₁₂		Q ₁₁₃ T ₁₁₃ S ₁₁₃		Q ₁₁₄ T ₁₁₄ S ₁₁₄		Q ₁₁₅ T ₁₁₅ S ₁₁₅		Q ₁₁₆ T ₁₁₆ S ₁₁₆		Q ₁₁₇ T ₁₁₇ S ₁₁₇		Q ₁₁₈ T ₁₁₈ S ₁₁₈		Q ₁₁₉ T ₁₁₉ S ₁₁₉		Q ₁₂₀ T ₁₂₀ S ₁₂₀		Q ₁₂₁ T ₁₂₁ S ₁₂₁		Q ₁₂₂ T ₁₂₂ S ₁₂₂		Q ₁₂₃ T ₁₂₃ S ₁₂₃		Q ₁₂₄ T ₁₂₄ S ₁₂₄		Q ₁₂₅ T ₁₂₅ S ₁₂₅		Q ₁₂₆ T ₁₂₆ S ₁₂₆		Q ₁₂₇ T ₁₂₇ S ₁₂₇		Q ₁₂₈ T ₁₂₈ S ₁₂₈		Q ₁₂₉ T ₁₂₉ S ₁₂₉		Q ₁₃₀ T ₁₃₀ S ₁₃₀		Q ₁₃₁ T ₁₃₁ S ₁₃₁		Q ₁₃₂ T ₁₃₂ S ₁₃₂		Q ₁₃₃ T ₁₃₃ S ₁₃₃		Q ₁₃₄ T ₁₃₄ S ₁₃₄		Q ₁₃₅ T ₁₃₅ S ₁₃₅		Q ₁₃₆ T ₁₃₆ S ₁₃₆		Q ₁₃₇ T ₁₃₇ S ₁₃₇		Q ₁₃₈ T ₁₃₈ S ₁₃₈		Q ₁₃₉ T ₁₃₉ S ₁₃₉		Q ₁₄₀ T ₁₄₀ S ₁₄₀		Q ₁₄₁ T ₁₄₁ S ₁₄₁		Q ₁₄₂ T ₁₄₂ S ₁₄₂		Q ₁₄₃ T ₁₄₃ S ₁₄₃		Q ₁₄₄ T ₁₄₄ S ₁₄₄		Q ₁₄₅ T ₁₄₅ S ₁₄₅		Q ₁₄₆ T ₁₄₆ S ₁₄₆		Q ₁₄₇ T ₁₄₇ S ₁₄₇		Q ₁₄₈ T ₁₄₈ S ₁₄₈		Q ₁₄₉ T ₁₄₉ S ₁₄₉		Q ₁₅₀ T ₁₅₀ S ₁₅₀		Q ₁₅₁ T ₁₅₁ S ₁₅₁		Q ₁₅₂ T ₁₅₂ S ₁₅₂		Q ₁₅₃ T ₁₅₃ S ₁₅₃		Q ₁₅₄ T ₁₅₄ S ₁₅₄		Q ₁₅₅ T ₁₅₅ S ₁₅₅		Q ₁₅₆ T ₁₅₆ S ₁₅₆		Q ₁₅₇ T ₁₅₇ S ₁₅₇		Q ₁₅₈ T ₁₅₈ S ₁₅₈		Q ₁₅₉ T ₁₅₉ S ₁₅₉		Q ₁₆₀ T ₁₆₀ S ₁₆₀		Q ₁₆₁ T ₁₆₁ S ₁₆₁		Q ₁₆₂ T ₁₆₂ S ₁₆₂		Q ₁₆₃ T ₁₆₃ S ₁₆₃		Q ₁₆₄ T ₁₆₄ S ₁₆₄		Q ₁₆₅ T ₁₆₅ S ₁₆₅		Q ₁₆₆ T ₁₆₆ S ₁₆₆		Q ₁₆₇ T ₁₆₇ S ₁₆₇		Q ₁₆₈ T ₁₆₈ S ₁₆₈		Q ₁₆₉ T ₁₆₉ S ₁₆₉		Q ₁₇₀ T ₁₇₀ S ₁₇₀		Q ₁₇₁ T ₁₇₁ S ₁₇₁		Q ₁₇₂ T ₁₇₂ S ₁₇₂		Q ₁₇₃ T ₁₇₃ S ₁₇₃		Q ₁₇₄ T ₁₇₄ S ₁₇₄		Q ₁₇₅ T ₁₇₅ S ₁₇₅		Q ₁₇₆ T ₁₇₆ S ₁₇₆		Q ₁₇₇ T ₁₇₇ S ₁₇₇		Q ₁₇₈ T ₁₇₈ S ₁₇₈		Q ₁₇₉ T ₁₇₉ S ₁₇₉		Q ₁₈₀ T ₁₈₀ S ₁₈₀		Q ₁₈₁ T ₁₈₁ S ₁₈₁		Q ₁₈₂ T ₁₈₂ S ₁₈₂		Q ₁₈₃ T ₁₈₃ S ₁₈₃		Q ₁₈₄ T ₁₈₄ S ₁₈₄		Q ₁₈₅ T ₁₈₅ S ₁₈₅		Q ₁₈₆ T ₁₈₆ S ₁₈₆		Q ₁₈₇ T ₁₈₇ S ₁₈₇		Q ₁₈₈ T ₁₈₈ S ₁₈₈		Q ₁₈₉ T ₁₈₉ S ₁₈₉		Q ₁₉₀ T ₁₉₀ S ₁₉₀		Q ₁₉₁ T ₁₉₁ S ₁₉₁		Q ₁₉₂ T ₁₉₂ S ₁₉₂		Q ₁₉₃ T ₁₉₃ S ₁₉₃		Q ₁₉₄ T ₁₉₄ S ₁₉₄		Q ₁₉₅ T ₁₉₅ S ₁₉₅		Q ₁₉₆ T ₁₉₆ S ₁₉₆		Q ₁₉₇ T ₁₉₇ S ₁₉₇		Q ₁₉₈ T ₁₉₈ S ₁₉₈		Q ₁₉₉ T ₁₉₉ S ₁₉₉		Q ₂₀₀ T ₂₀₀ S ₂₀₀		Q ₂₀₁ T ₂₀₁ S ₂₀₁		Q ₂₀₂ T ₂₀₂ S ₂₀₂		Q ₂₀₃ T ₂₀₃ S ₂₀₃		Q ₂₀₄ T ₂₀₄ S ₂₀₄		Q ₂₀₅ T ₂₀₅ S ₂₀₅		Q ₂₀₆ T ₂₀₆ S ₂₀₆		Q ₂₀₇ T ₂₀₇ S ₂₀₇		Q ₂₀₈ T ₂₀₈ S ₂₀₈		Q ₂₀₉ T ₂₀₉ S ₂₀₉		Q ₂₁₀ T ₂₁₀ S ₂₁₀		Q ₂₁₁ T ₂₁₁ S ₂₁₁		Q ₂₁₂ T ₂₁₂ S ₂₁₂		Q ₂₁₃ T ₂₁₃ S ₂₁₃		Q ₂₁₄ T ₂₁₄ S ₂₁₄		Q ₂₁₅ T ₂₁₅ S ₂₁₅		Q ₂₁₆ T ₂₁₆ S ₂₁₆		Q ₂₁₇ T ₂₁₇ S ₂₁₇		Q ₂₁₈ T ₂₁₈ S ₂₁₈		Q ₂₁₉ T ₂₁₉ S ₂₁₉		Q ₂₂₀ T ₂₂₀ S ₂₂₀		Q ₂₂₁ T ₂₂₁ S ₂₂₁		Q ₂₂₂ T ₂₂₂ S ₂₂₂		Q ₂₂₃ T ₂₂₃ S ₂₂₃		Q ₂₂₄ T ₂₂₄ S ₂₂₄		Q ₂₂₅ T ₂₂₅ S ₂₂₅		Q ₂₂₆ T ₂₂₆ S ₂₂₆		Q ₂₂₇ T ₂₂₇ S ₂₂₇		Q ₂₂₈ T ₂₂₈ S ₂₂₈		Q ₂₂₉ T ₂₂₉ S ₂₂₉		Q ₂₃₀ T ₂₃₀ S ₂₃₀		Q ₂₃₁ T ₂₃₁ S ₂₃₁		Q ₂₃₂ T ₂₃₂ S ₂₃₂		Q ₂₃₃ T ₂₃₃ S ₂₃₃		Q ₂₃₄ T ₂₃₄ S ₂₃₄		Q ₂₃₅ T ₂₃₅ S ₂₃₅		Q ₂₃₆ T ₂₃₆ S ₂₃₆		Q ₂₃₇ T ₂₃₇ S ₂₃₇		Q ₂₃₈ T ₂₃₈ S ₂₃₈		Q ₂₃₉ T ₂₃₉ S ₂₃₉		Q ₂₄₀ T ₂₄₀ S ₂₄₀		Q ₂₄₁ T ₂₄₁ S ₂₄₁		Q ₂₄₂ T ₂₄₂ S ₂₄₂		Q ₂₄₃ T ₂₄₃ S ₂₄₃		Q ₂₄₄ T ₂₄₄ S ₂₄₄		Q ₂₄₅ T ₂₄₅ S ₂₄₅		Q ₂₄₆ T ₂₄₆ S ₂₄₆		Q ₂₄₇ T ₂₄₇ S ₂₄₇		Q ₂₄₈ T ₂₄₈ S ₂₄₈		Q ₂₄₉ T ₂₄₉ S ₂₄₉		Q ₂₅₀ T ₂₅₀ S ₂₅₀		Q ₂₅₁ T ₂₅₁ S ₂₅₁		Q ₂₅₂ T ₂₅₂ S ₂₅₂		Q ₂₅₃ T ₂₅₃ S ₂₅₃		Q ₂₅₄ T ₂₅₄ S ₂₅₄		Q ₂₅₅ T ₂₅₅ S ₂₅₅		Q ₂₅₆ T ₂₅₆ S ₂₅₆		Q ₂₅₇ T ₂₅₇ S ₂₅₇		Q ₂₅₈ T ₂₅₈ S ₂₅₈		Q ₂₅₉ T ₂₅₉ S ₂₅₉		Q ₂₆₀ T ₂₆₀ S ₂₆₀		Q ₂₆₁ T ₂₆₁ S ₂₆₁		Q ₂₆₂ T ₂₆₂ S ₂₆₂		Q ₂₆₃ T ₂₆₃ S ₂₆₃		Q ₂₆₄ T ₂₆₄ S ₂₆₄		Q ₂₆₅ T ₂₆₅ S ₂₆₅		Q ₂₆₆ T ₂₆₆ S ₂₆₆		Q ₂₆₇ T ₂₆₇ S ₂₆₇		Q ₂₆₈ T ₂₆₈ S ₂₆₈		Q ₂₆₉ T ₂₆₉ S ₂₆₉		Q ₂₇₀ T ₂₇₀ S ₂₇₀		Q ₂₇₁ T ₂₇₁ S ₂₇₁		Q ₂₇₂ T ₂₇₂ S ₂₇₂		Q ₂₇₃ T ₂₇₃ S ₂₇₃		Q ₂₇₄ T ₂₇₄ S ₂₇₄		Q ₂₇₅ T ₂₇₅ S ₂₇₅		Q ₂₇₆ T ₂₇₆ S ₂₇₆		Q ₂₇₇ T ₂₇₇ S ₂₇₇		Q ₂₇₈ T ₂₇₈ S ₂₇₈		Q ₂₇₉ T ₂₇₉ S ₂₇₉		Q ₂₈₀ T ₂₈₀ S ₂₈₀		Q ₂₈₁ T ₂₈₁ S ₂₈₁		Q ₂₈₂ T ₂₈₂ S ₂₈₂		Q ₂₈₃ T ₂₈₃ S ₂₈₃		Q ₂₈₄ T ₂₈₄ S ₂₈₄		Q ₂₈₅ T ₂₈₅ S ₂₈₅		Q ₂₈₆ T ₂₈₆ S ₂₈₆		Q ₂₈₇ T ₂₈₇ S ₂₈₇		Q ₂₈₈ T ₂₈₈ S ₂₈₈		Q ₂₈₉ T ₂₈₉ S ₂₈₉		Q ₂₉₀ T ₂₉₀ S ₂₉₀		Q ₂₉₁ T ₂₉₁ S ₂₉₁		Q ₂₉₂ T ₂₉₂ S ₂₉₂		Q ₂₉₃ T ₂₉₃ S ₂₉₃		Q ₂₉₄ T ₂₉₄ S ₂₉₄		Q ₂₉₅ T ₂₉₅ S ₂₉₅		Q ₂₉₆ T ₂₉₆ S ₂₉₆		Q ₂₉₇ T ₂₉₇ S ₂₉₇		Q ₂₉₈ T ₂₉₈ S ₂₉₈		Q ₂₉₉ T ₂₉₉ S ₂₉₉		Q ₃₀₀ T ₃₀₀ S ₃₀₀		Q ₃₀₁ T ₃₀₁ S ₃₀₁		Q ₃₀₂ T ₃₀₂ S ₃₀₂		Q ₃₀₃ T ₃₀₃ S ₃₀₃		Q ₃₀₄ T ₃₀₄ S ₃₀₄		Q ₃₀₅ T ₃₀₅ S ₃₀₅		Q ₃₀₆ T ₃₀₆ S ₃₀₆		Q ₃₀₇ T ₃₀₇ S ₃₀₇		Q ₃₀₈ T ₃₀₈ S ₃₀₈		Q ₃₀₉ T ₃₀₉ S ₃₀₉		Q ₃₁₀ T ₃₁₀ S ₃₁₀		Q ₃₁₁ T ₃₁₁ S ₃₁₁		Q ₃₁₂ T ₃₁₂ S ₃₁₂		Q ₃₁₃ T ₃₁₃ S ₃₁₃		Q ₃₁₄ T ₃₁₄ S ₃₁₄		Q ₃₁₅ T ₃₁₅ S ₃₁₅		Q ₃₁₆ T ₃₁₆ S ₃₁₆		Q ₃₁₇ T ₃₁₇ S ₃₁₇		Q ₃₁₈ T ₃₁₈ S ₃₁₈		Q ₃₁₉ T ₃₁₉ S ₃₁₉		Q ₃₂₀ T ₃₂₀ S ₃₂₀		Q ₃₂₁ T ₃₂₁ S ₃₂₁		Q ₃₂₂ T ₃₂₂ S ₃₂₂		Q ₃₂₃ T ₃₂₃ S ₃₂₃		Q ₃₂₄ T ₃₂₄ S ₃₂₄		Q ₃₂₅ T ₃₂₅ S ₃₂₅		Q ₃₂₆ T ₃₂₆ S ₃₂₆		Q ₃₂₇ T ₃₂₇ S ₃₂₇		Q ₃₂₈ T ₃₂₈ S ₃₂₈		Q ₃₂₉ T ₃₂	
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FORMAT FOR NORMAL & STORM MAGNETOGRAMS (SAMPLE ONLY)

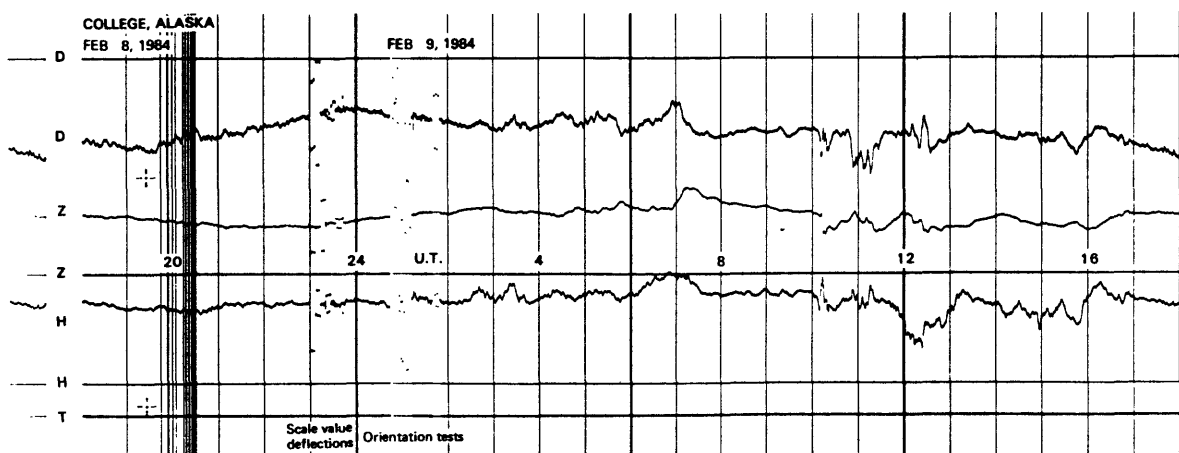
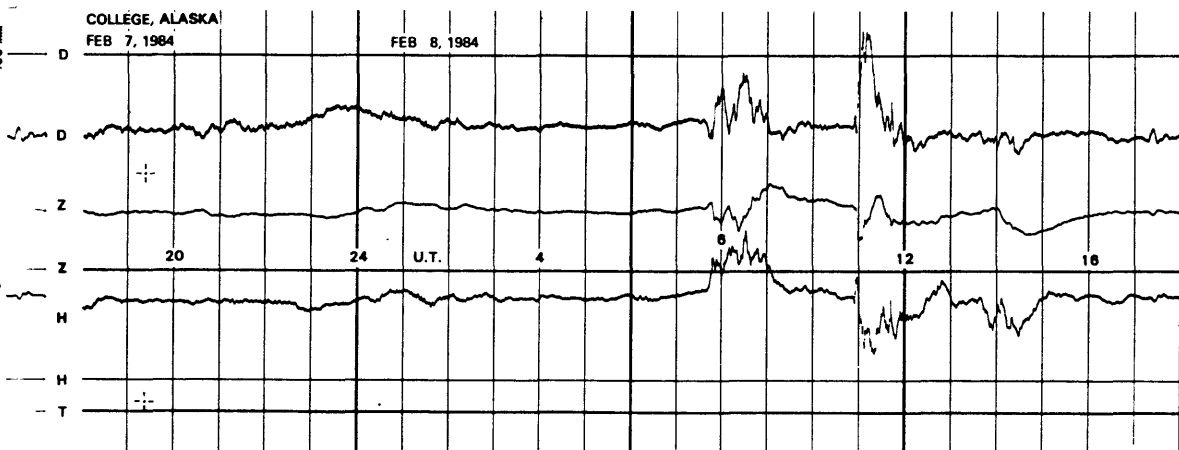
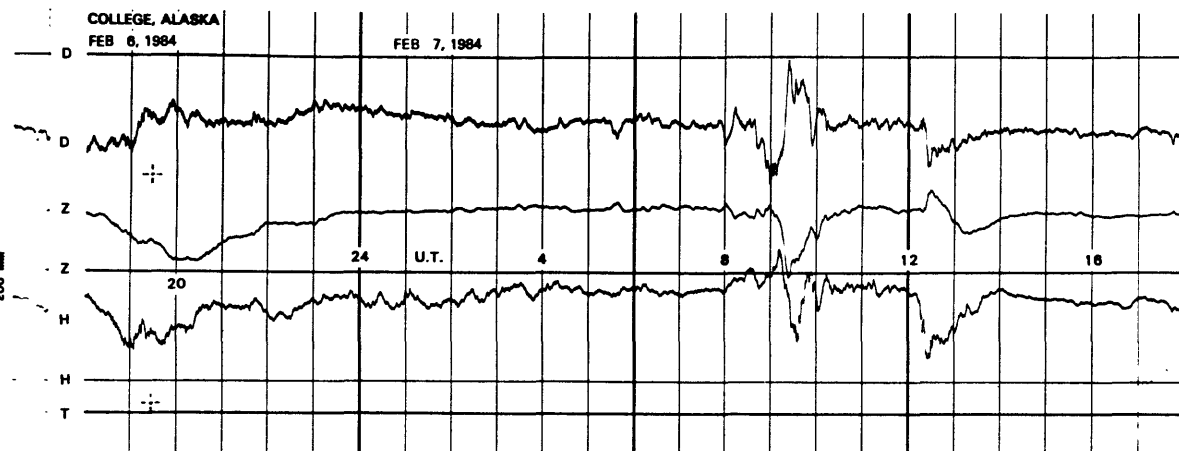
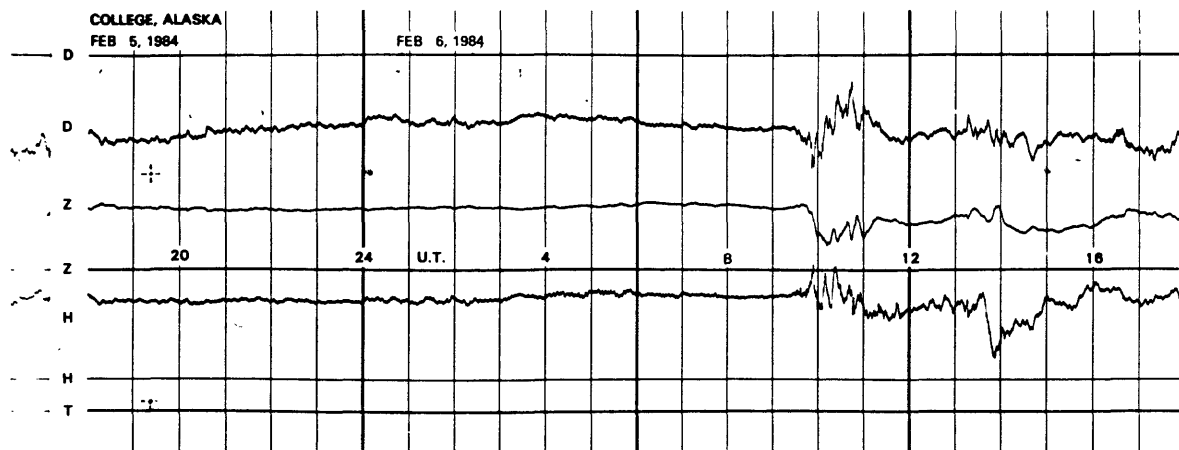


SEE PRELIMINARY CALIBRATION DATA FOR SCALE VALUES & BASELINE VALUES

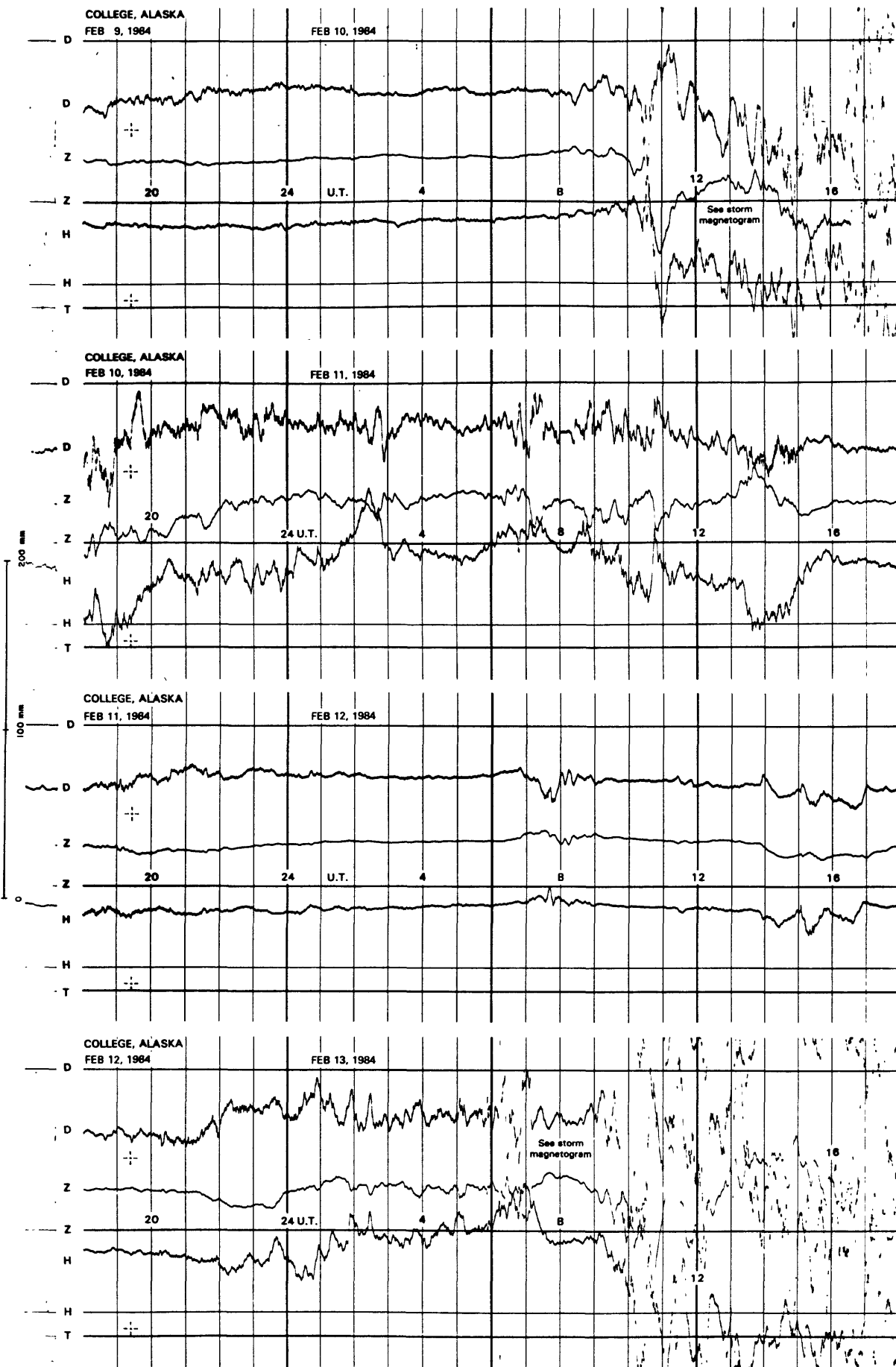
NORMAL MAGNETOGRAMS



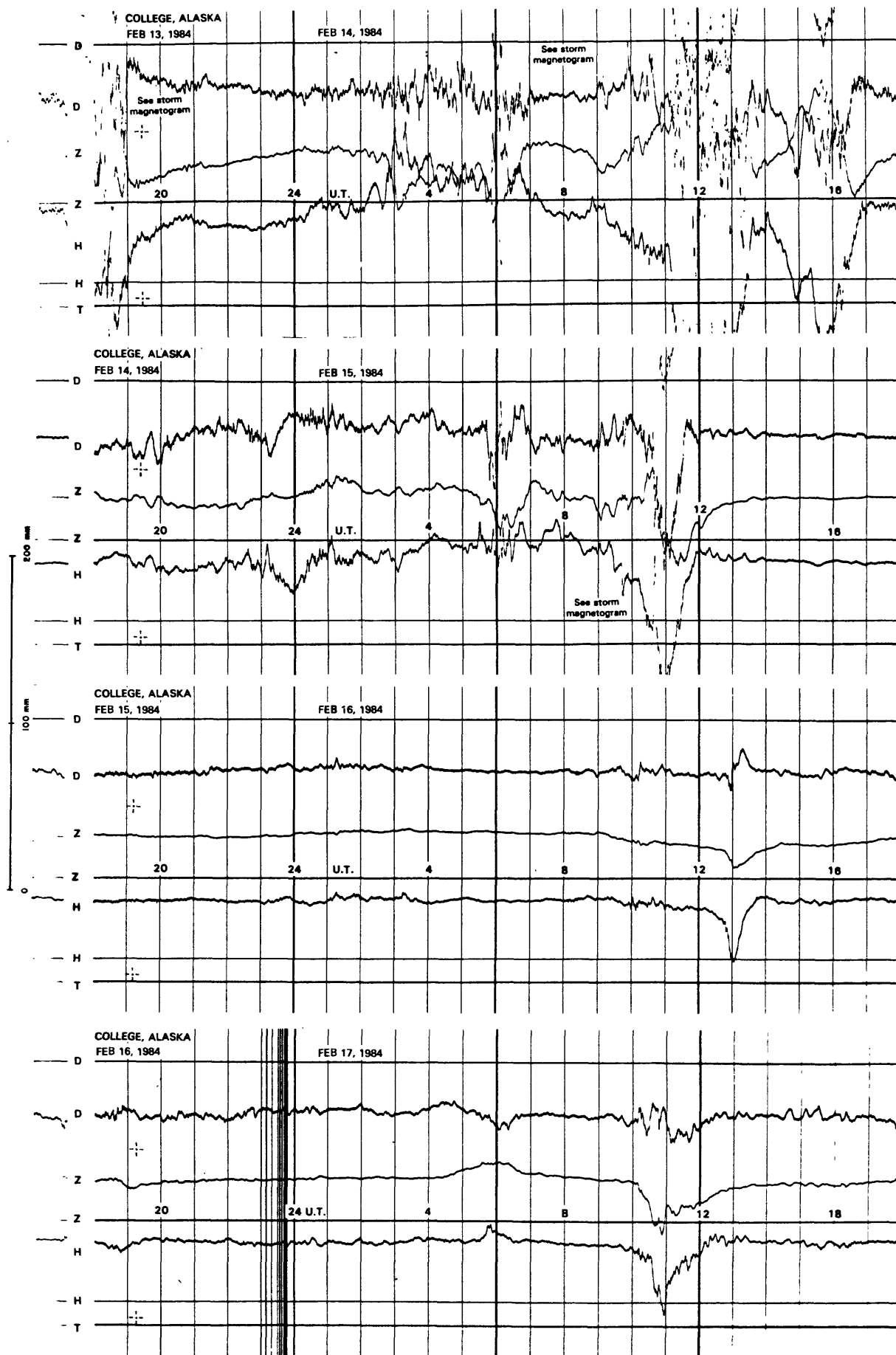
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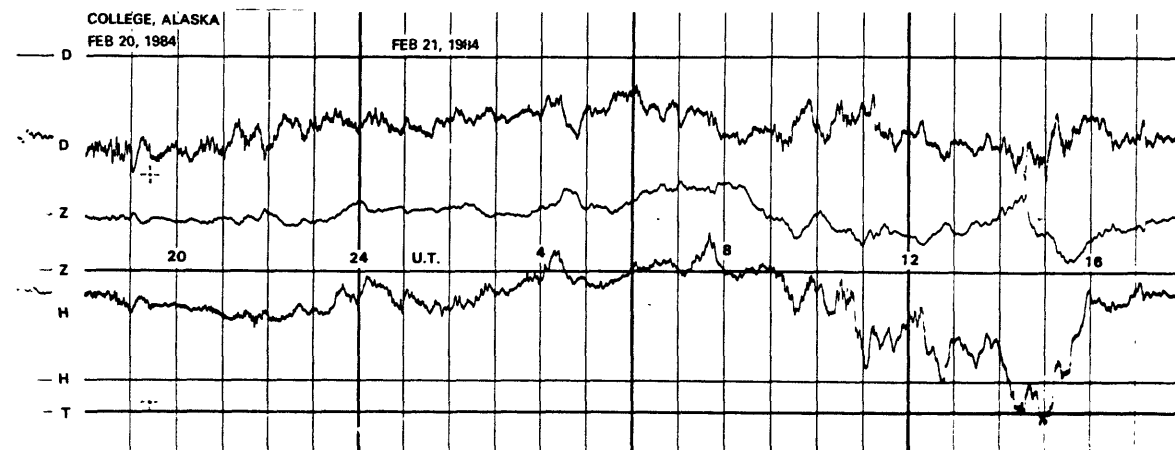
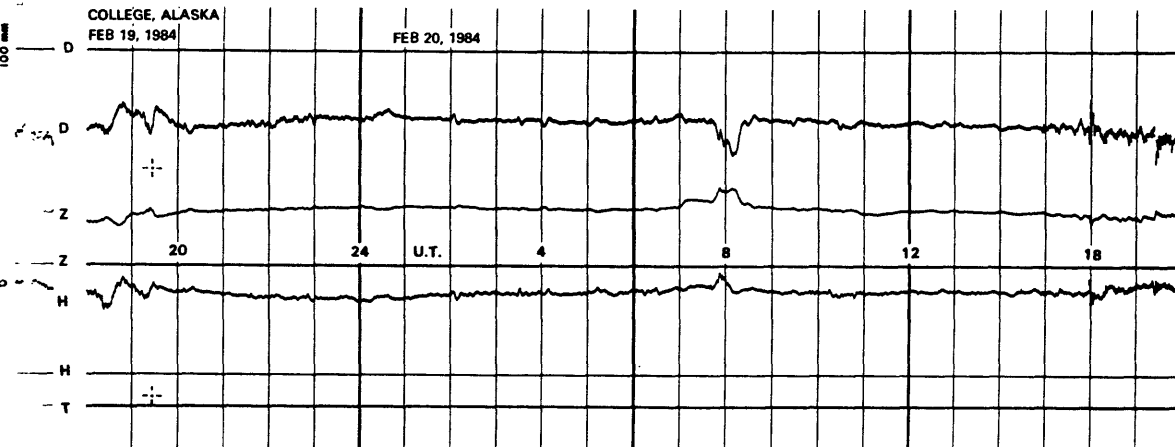
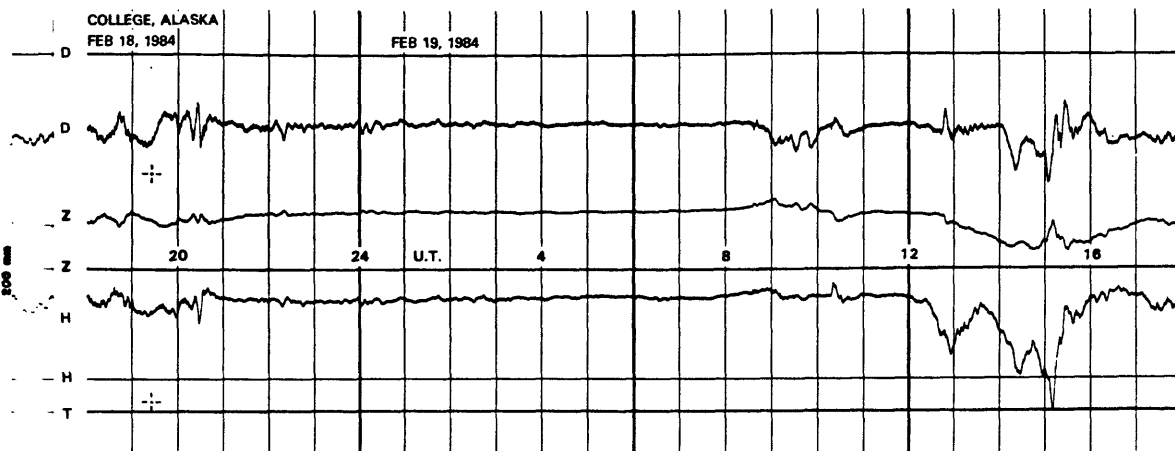
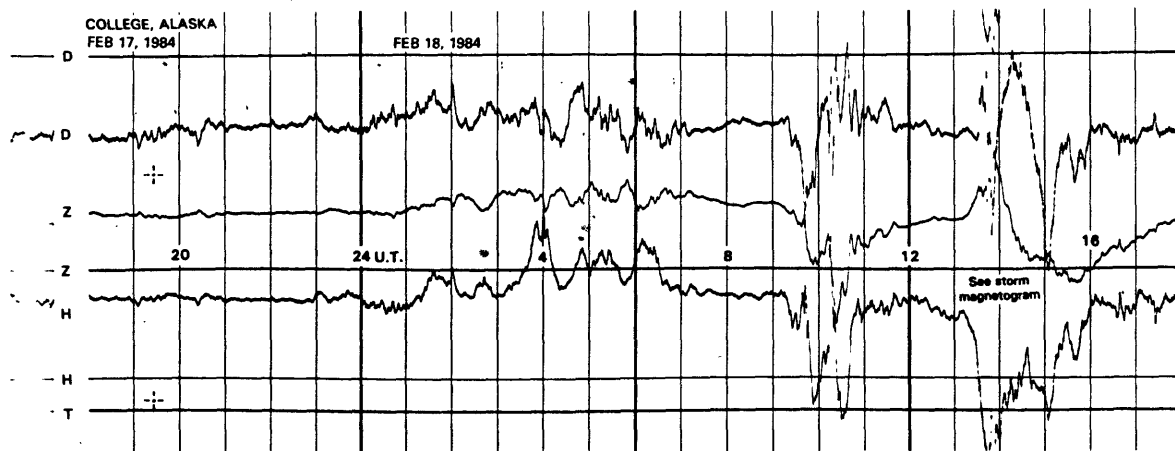
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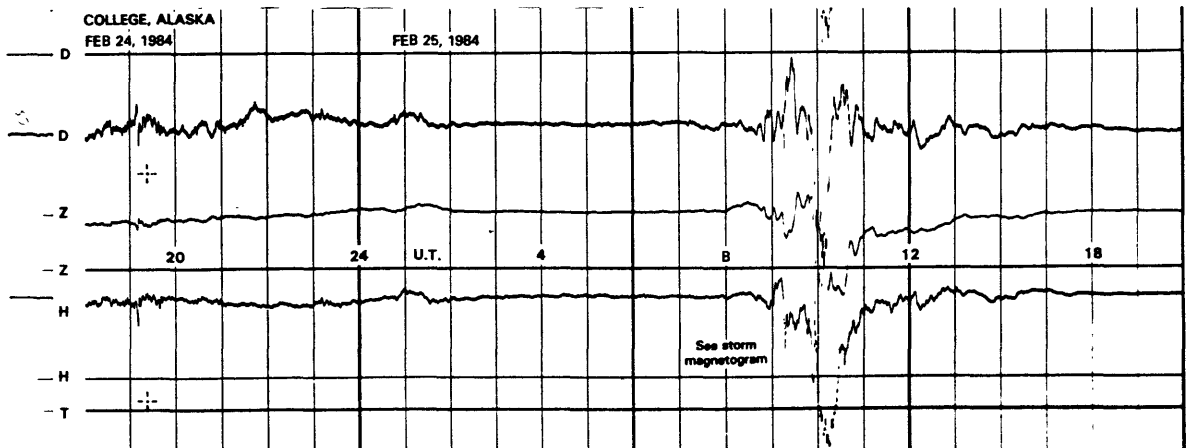
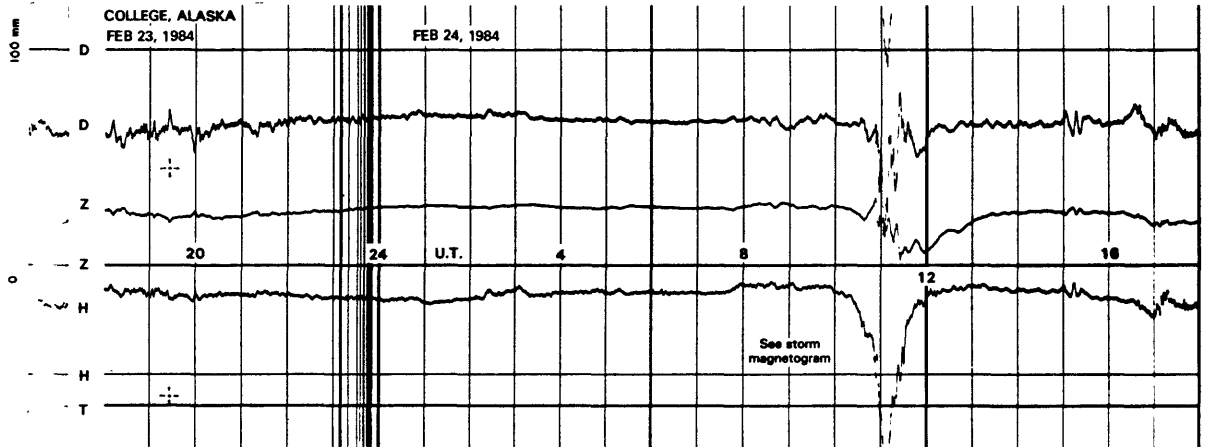
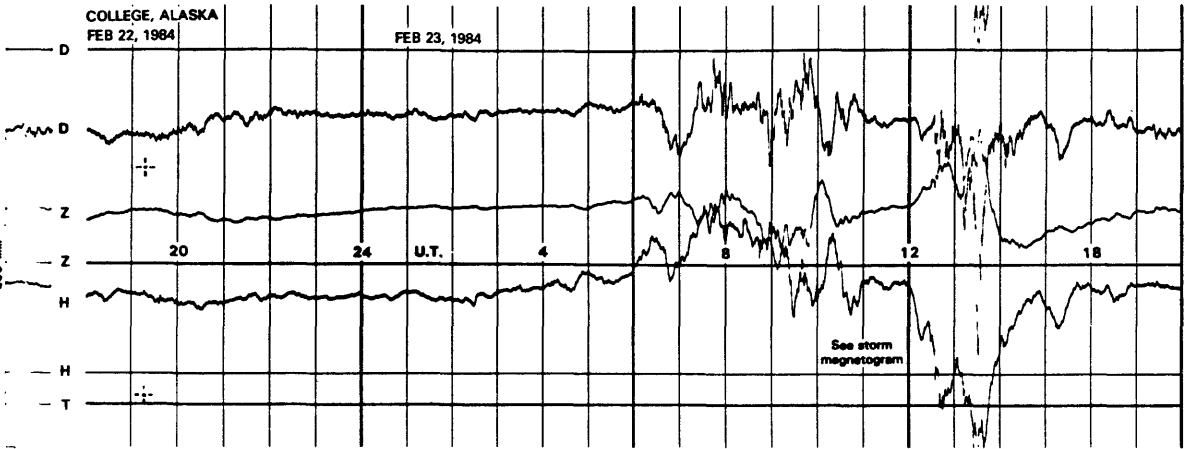
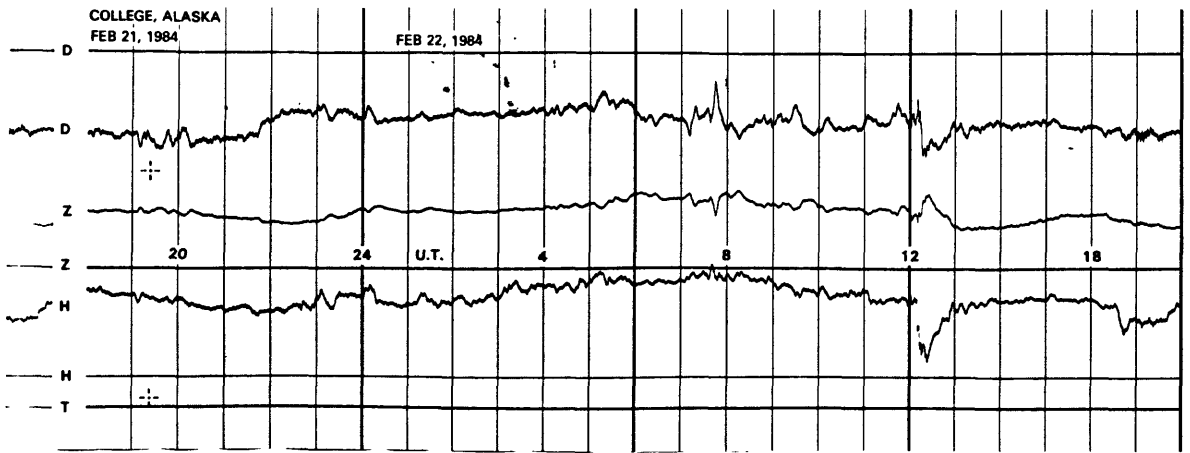
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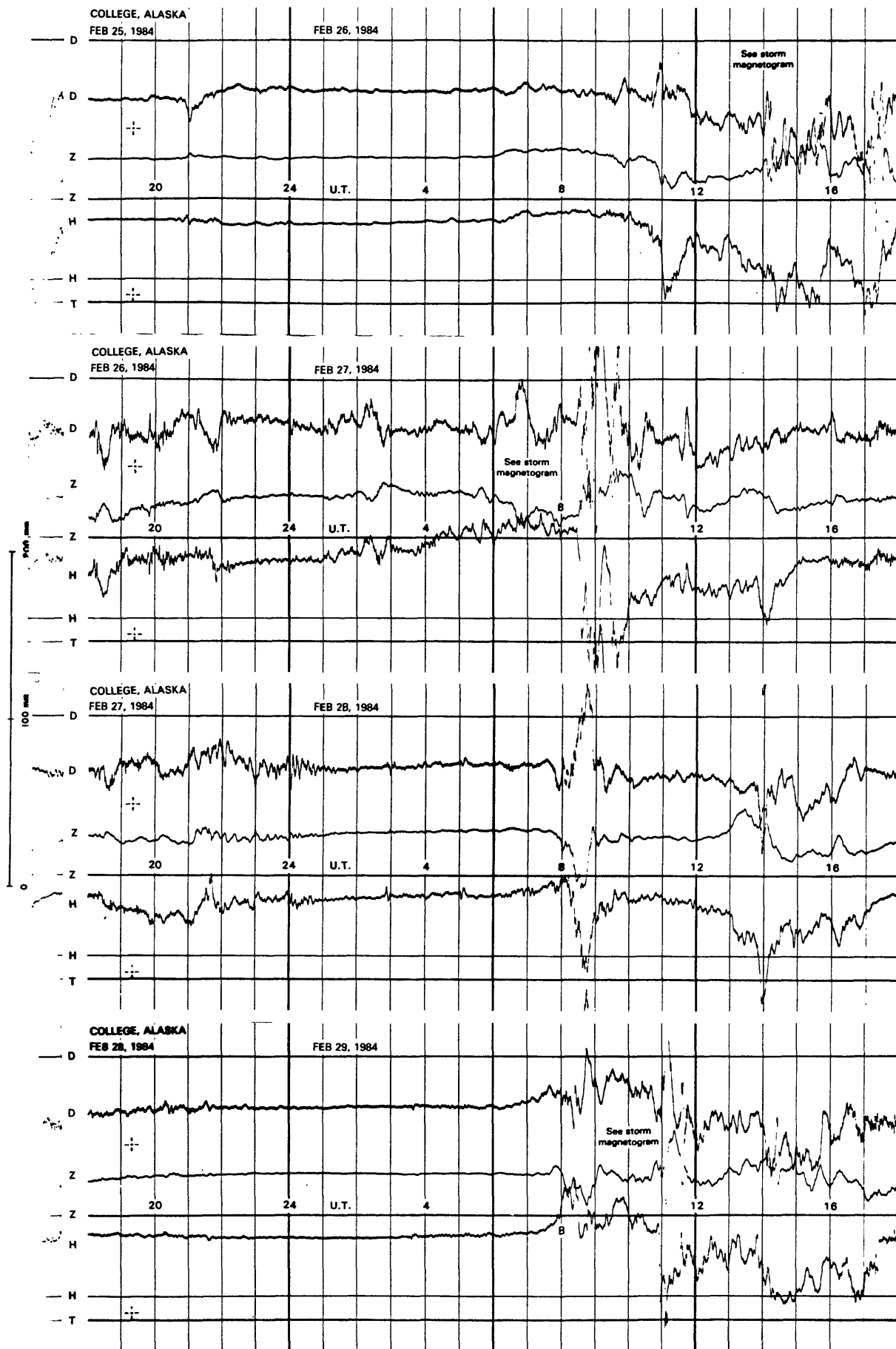
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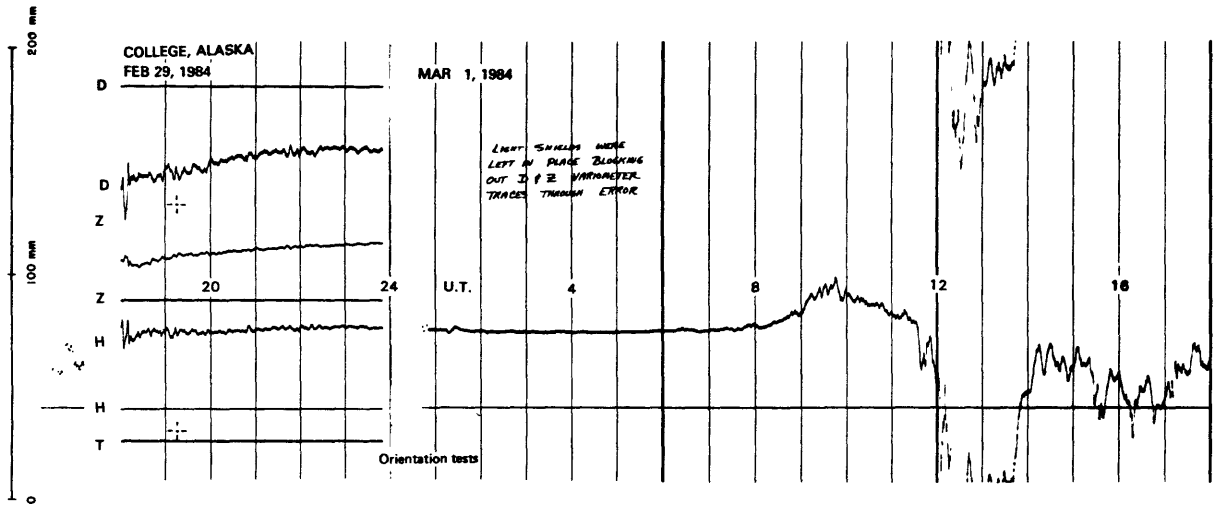
NORMAL MAGNETOGRAMS



NORMAL MAGNETOGRAMS

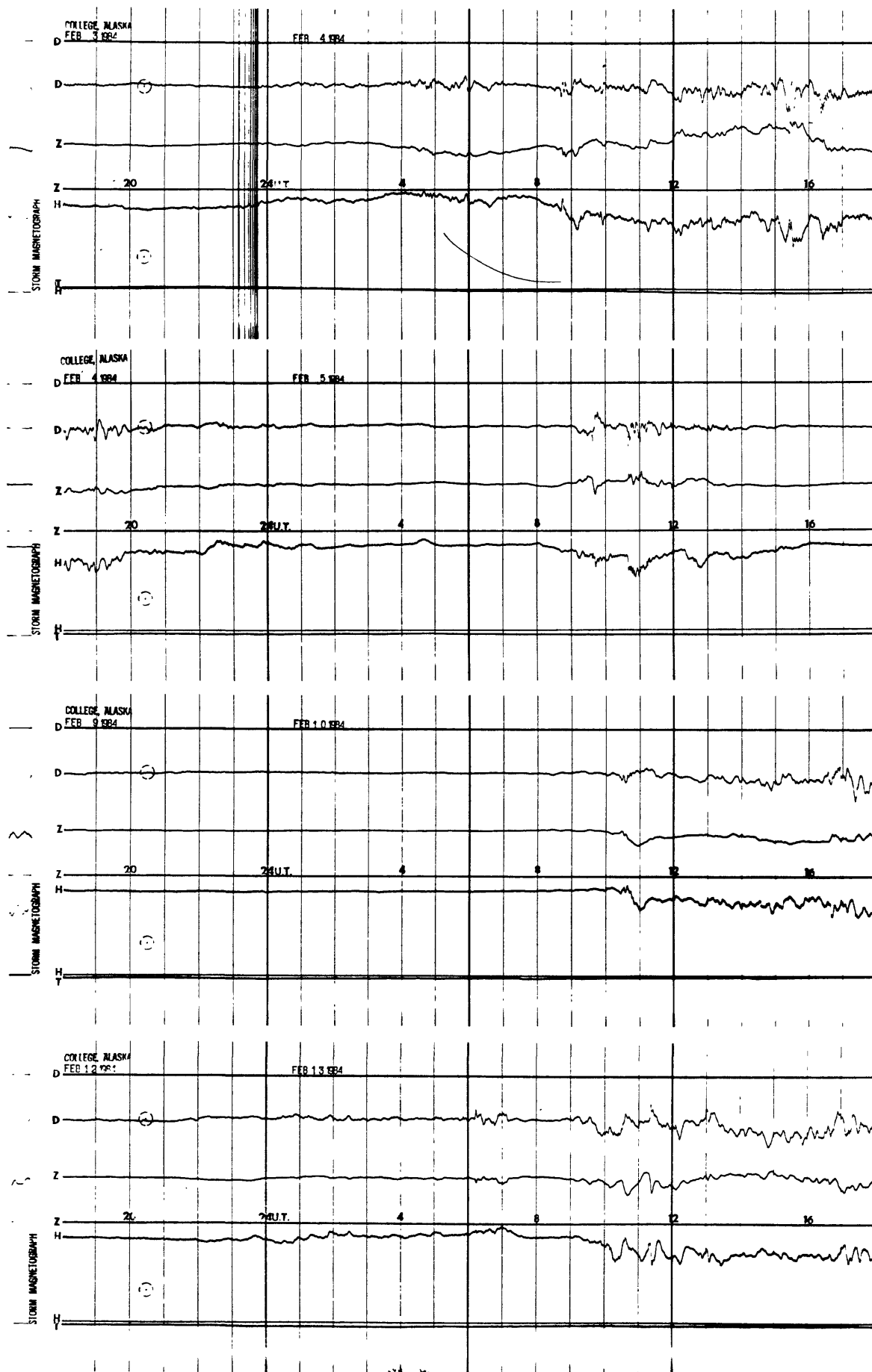


NORMAL MAGNETOGRAMS



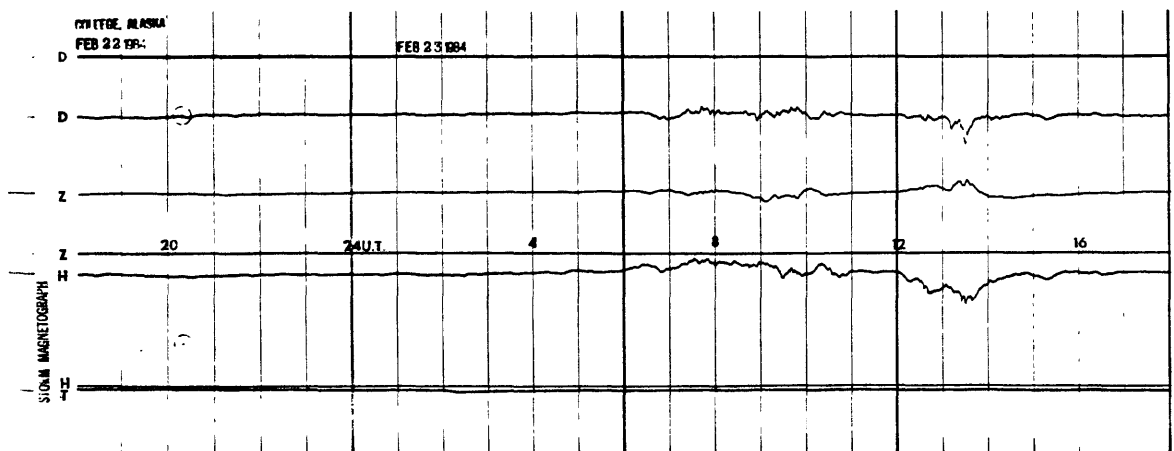
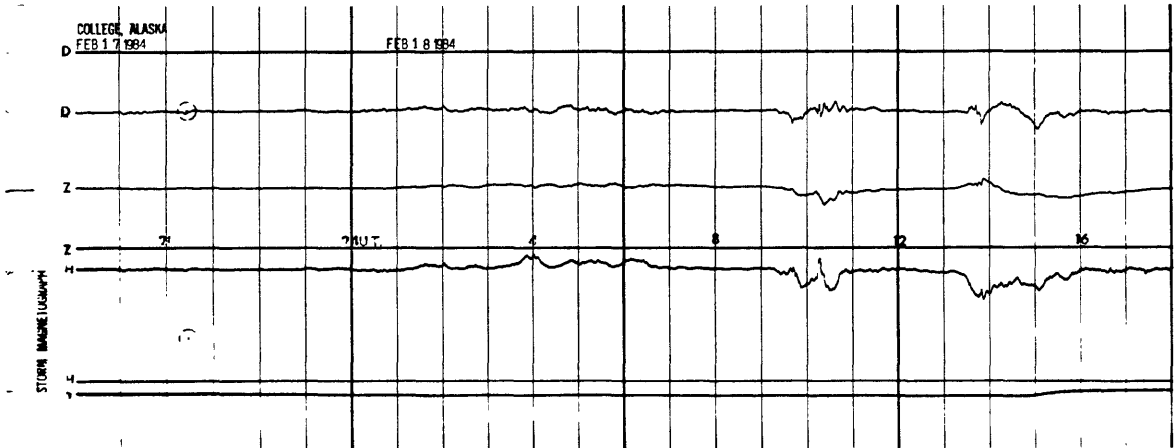
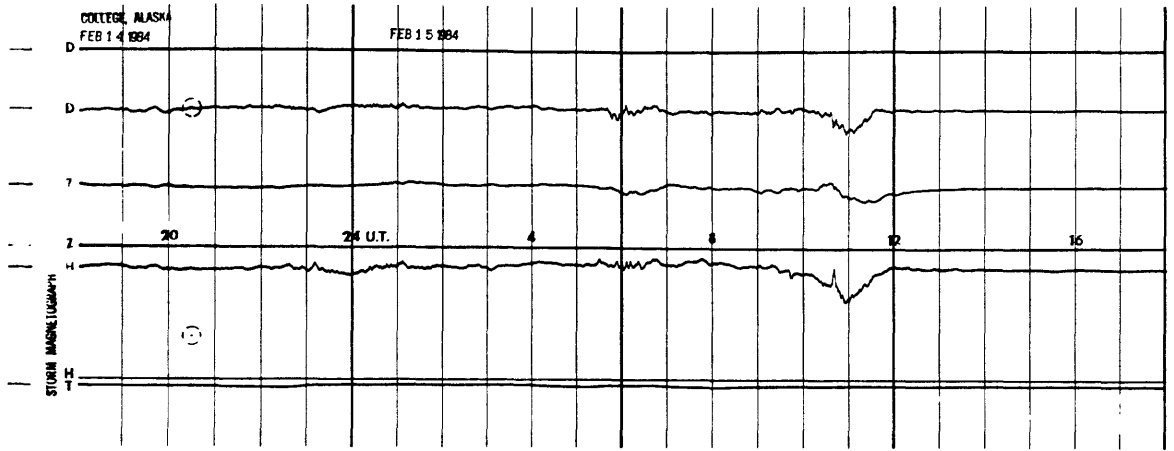
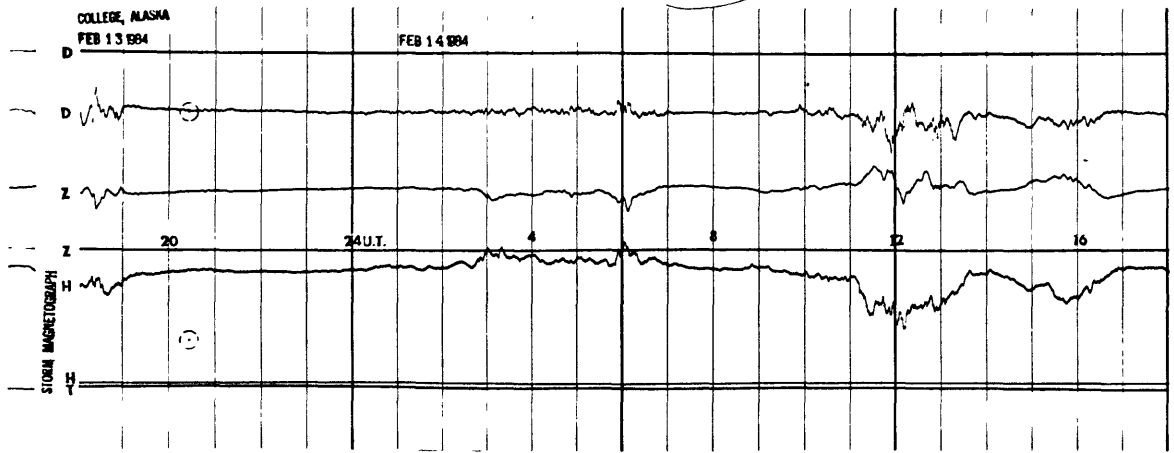
STORM MAGNETOGRAMS

200 mm
100 mm
0



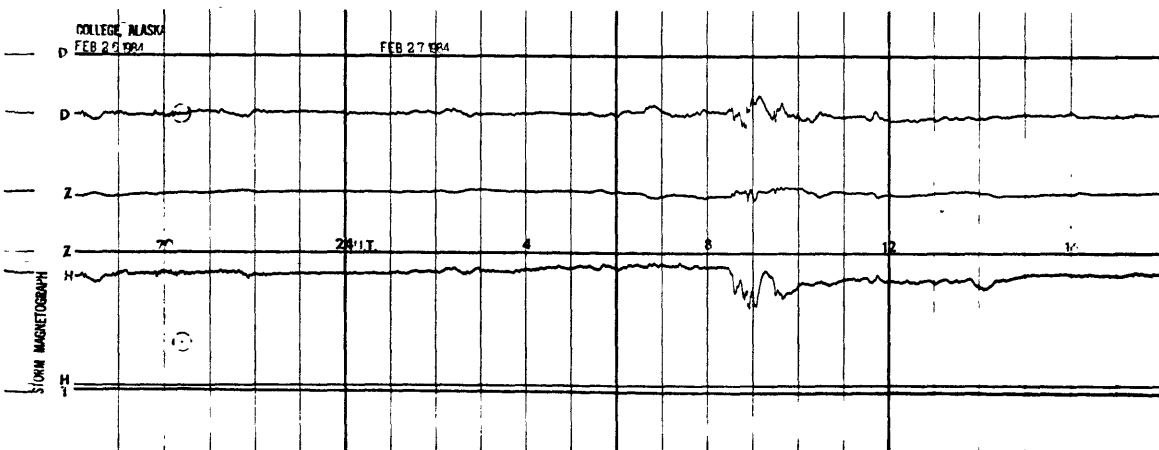
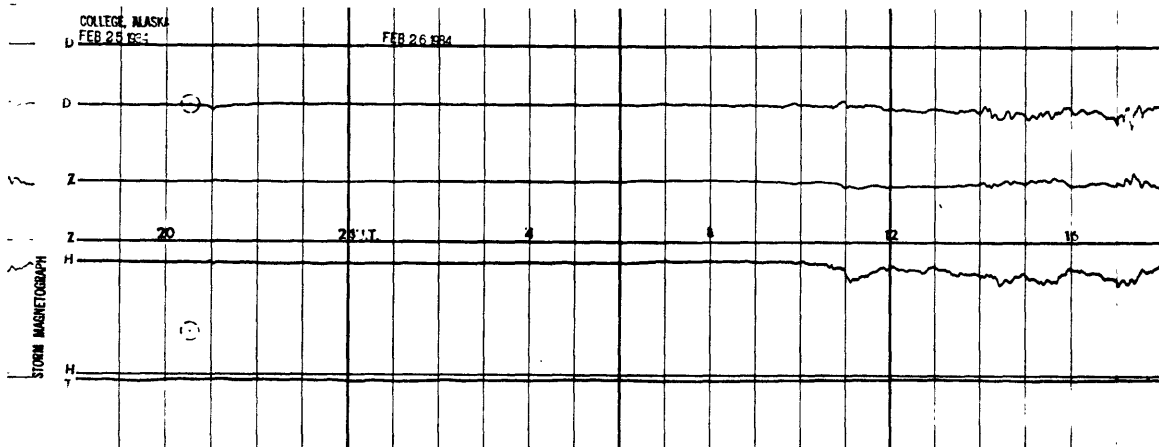
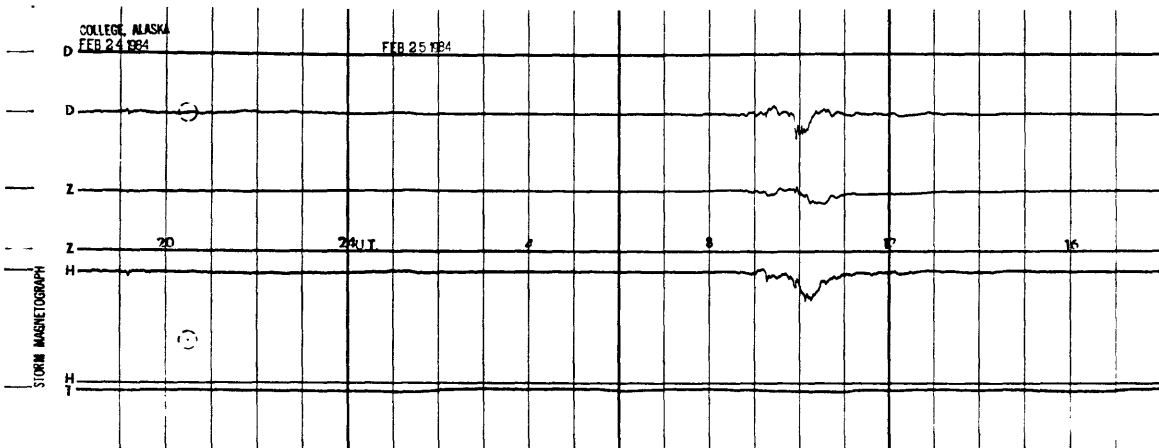
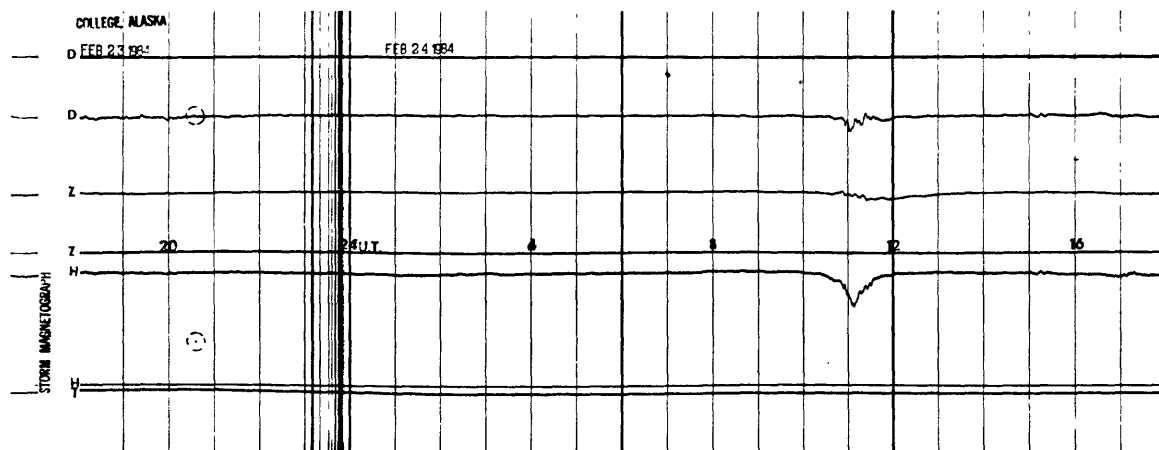
STORM MAGNETOGRAMS

200 mm
100 mm
0



STORM MAGNETOGRAMS

200 mm
100 mm
0



STORM MAGNETOGRAMS

